

MORBIDITY RELATED TO ALTERNATING SHIFT WORK

NICULINA CRĂCIUN¹, DORIN IOSIF BARDAC²¹PhD candidate "Lucian Blaga" University of Sibiu, ²"Lucian Blaga" University of Sibiu**Keywords:** *alternating shift work, biological rhythms***Abstract:** *In alternating shift work due to possible banded biologically related to the disruption of the professional activity and the mismatch between some of the functions of the body. The article aims at proving that alternating shift work can have somatic and neuropathic effects on the human body. The present research has been conducted on a number of 100 workers (physicians, nurses) working in alternating shift work within the County Hospital of Târgoviște and 100 workers (economists, accountants, statisticians, mechanics etc.) who develop their working activity in a single shift.***Cuvinte cheie:** *munca în schimburi alternante, ritmuri biologice***Rezumat:** *În munca în schimburi alternante apar suprasolicitări de ordin biologic legate de fenomenul de desincronizare din cadrul activității profesionale și de neconcordanță între unele funcții ale organismului. Articolul își propune să demonstreze că munca în schimburi alternante practică o anumită perioadă de timp produce efecte somatice și neuropsihice. Cercetarea, în studiul de față s-a efectuat pe un lot de 100 salariați (medici, asistente, infirmiere) care lucrează în schimburi alternante în Spitalul Județean Târgoviște și 100 salariați (economisti, contabili, statisticieni, mecanici etc.) care-și desfășoară activitatea într-un singur schimb.***INTRODUCTION**

Alternating shift work is a way of timely organizing the professional activities or the teams of workers.

The overuse of the body takes place when you move from one shift to another because there are efforts to change the biological rhythms (circadian, monthly, yearly – evolution of the biological indicators over a well determined period of time – central body temperature, respiratory rate, blood concentrations of certain minerals, hormones).(2)

Alternating shift work causes the reversal of the sleep-wake rhythm.

Biological rhythm synchronization to the new professional rhythm is related to the type of professional activity, age, sleep (a satisfactory sleep, both qualitative and quantitative).

Occupational health issues are related to the correlations and non-correlations of biological rhythms, professional rhythms (timely organization of activities) and the extraprofessional ones imposed by the family/social obligations, needs.(4)

In terms of work-related pathology in alternating shifts, this can be defined by: sleep disorders, in terms of quality and quantity -chronic fatigue and sleepiness,(1) neuropsychological disorders (irritability, nervousness, decreased attention, dizziness, headache, depressed mood, anxiety or stress occurring in the transition from one shift to another),(3) digestive disorders, increased cardiovascular risk, effects on the reproductive ability (especially in women), triggering and/or exacerbate pre-existing chronic diseases, premature-aging,(5) carcinogenic factor-perhaps.

The non-correlation between the biological rhythm and the professional one can generate work accidents (by

decreasing attention and/or other superior nerve functions due to sleep disorders, chronic fatigue).(7)

The night work is defined by the Romanian Labour Code as the work carried out between 22⁰⁰-6⁰⁰; it is a work performed less than 3 hours during the day, or at least 30% of the monthly working time (article 122).(6)

PURPOSE

The article aims at demonstrating that shift work carried out for a certain period of time brings effects at the level of the human body materialized by:

- immediate and late neuropsychological effects;
- effects on the digestive tract, cardiovascular, reproductive system (especially in women), exacerbating or triggering chronic diseases, early aging, sleep disorders, chronic fatigue and drowsiness.

The study is made on a batch of 100 employees working in alternating shifts in the County Hospital of Târgoviște and a control batch, made up of 100 employees, who work in a single shift.

METHODS

The research in the present study was carried out on 100 employees (doctors, nurses, domestics), working in alternating shifts in the County Hospital of Târgoviște and a control batch lot of control - 100 employees (economists, accountants, statisticians, engineers, etc.), who work in a single shift.

Both groups are made up of men and women in roughly equal proportions, with statistically insignificant differences in the following parameters: retirement age (between 10 and 30 years), length in alternating shifts (between 5 and 30 years).

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The changes produced at body level, due to the alternating shift work were established by:

- medical history (sleep disorders, irritability, fatigue, drowsiness);
- changes in blood pressure, pulse;
- amendments to the central body temperature, heart rate, respiratory rate;
- digestive disorders;
- metabolic disorders.

RESULTS

The evaluation of the cause-effect relation can be done by several means:

- incidence (number of new cases of disease occurring in the researched batch and in the controls within one year);
- prevalence (all cases of disease in the researched batch and in the control group).

We used data from the year 2011 (retrospective study) and data from the year 2012 (prospective study).

We determined: the pulse, EKG, central body temperature, dystonia, neuro-vegetative disorders, sleep disorders, fatigue, sleepiness, or irritability. In the year 2013, we intend to determine the melatonin level in urine in the researched group, as well as in the control group.

Retrospective study

Table no. 1. Comparative analysis of the structure of the two batches in 2011

	Employees with HTA and heart disease	Employees with digestive disorders	Employees with sleep disorders
Study batch	94	88	90
Control batch	50	13	8

In 2011, 94 employees from the study batch were register with HTA and other heart diseases and only 50 employees in the control group, 88 employees with digestive disorders in the study batch and 13 employees in the control group, 90 employees with sleep disorders in the study batch and 8 employees in the control group.

In 2012, there have been 7 new cases of heart disease in the study batch and only 2 cases in the control group.

Digestive disorders were recorded in 5 cases in the study batch, and only 2 in the control group. Regarding the sleep disorders, in 2012, there appeared 8 new cases in the study batch and only 2 cases in the control group.

Prospective study

Table no. 2. New cases arising in the year 2012

	Employees with HTA and heart disease	Employees with digestive disorders	Employees with sleep disorders
Study batch	7	5	8
Control batch	2	2	2

The incidence of HTA and heart disease

HTA incidence in the study batch is of 7% as against only 2% in the witness batch, cardiovascular risk increasing due to the endocrine-metabolic changes and the intervention of other co-factors: sedentary life, obesity, metabolic syndrome, insulin resistance. Normally, the biological rhythms (arterial hypertension, cardiac rate, respiratory function, central body temperature, calcemia, cortical excitement and inhibition are

coordinated with the work developed during daytime (especially the work developed in the morning – shift I). When shifting, the body makes efforts to change the biological rhythms to the new professional rhythm. It has been noticed in the study batch, too, an increase percentage (70%), compared to only 2% in the control group (shift I). HTA and chronic diseases prevalence is of 94% in the study batch and of 50% in the control batch.

The incidence of digestive diseases

Digestive disorders and weight increase, dyspepsia, epigastralgia, regurgitations, ballooning, anorexia, constipation occur or are accentuated when turning from one shift to another. Also, certain gastro-intestinal disorders are exacerbated. The incidence of the digestive disorders is of 5% in the study batch and of only 2% in the control one. The prevalence of the digestive disorders is of 88% in the study batch and of 13% in the control group.

The incidence of sleep disorders

Sleep disorders, both qualitatively and quantitatively are more commonly in the study batch (8%), as against the witness batch (2%). There is a significant relation between insomnia, absenteeism and work. In the study batch, chronic fatigue and drowsiness are frequently encountered. The incidence of these disorders is of 10% in the study batch as against only 4% in the control batch. Regarding the prevalence of these disorders, it is of 90% in the study batch, compared to 10% in the witness batch.

Besides the above-mentioned disorders, other changes have been signalled regarding the reproductive capacity – decrease in fertility (especially in women), spontaneous abortions, growth-retarded fetuses, early aging.

DISCUSSIONS

Following the research made, it has been found that alternating shift work brings about changes at the level of the human body of those developing their work activity under such circumstances, compared to the workers who perform their working activity only in the day shift. These are reflected in the large number of disorders encountered in the study batch, as against the control one. Taking into account the fact that the medical activity requires developing alternating shift work, efforts are made to find those conditions as to reduce as much as possible the impact on the organism of those working in alternating shift works.

It has been observed that exposure to intense daylight (more than 60 lux) at the level of the working station allows maintaining vigilance and delays drowsiness (through the inhibition of melatonin secretion).

- maintaining 3 meals a day, quantitatively balanced;
- limitation in consuming stimulating beverages (coffee, black tea, Coca-Cola);
- taking light meals at 3,4 hours from the beginning of the shift in order to improve vigilance
- maintaining an organised schedule for the waking and sleeping hours;
- after a night of work, sleep should last for minimum 5/6 hours;
- creating favourable conditions to sleep;
- alternating shift work should be the free choice of the employee, knowing that the possibility to accept such a work depends on the satisfactions given by such type of work, family consent, wellness.

CONCLUSIONS

Studies made on the workers who operate in alternating shifts have led to the conclusion that they support a

number of changes to the body, translated in acute or chronic conditions.

The incidence and prevalence of heart disease, digestive disorders and sleep disorders are increased in the study group versus the control group, thus demonstrating that in shift work, biological strains occur due to the de-synchronisations within the professional activity and discrepancies between certain body functions.

REFERENCES

1. Bardac I, Stoia M Elemente de medicina muncii și boli profesionale . Sibiu: Editura Mira Design; 2004.
2. Vlăduț E. Cronobiologia în medicina muncii. Mediaș: Editura Samuel; 2011.
3. Cocarlă A. Medicină Ocupațională vol I. Cluj Napoca: Editura Medicală Universitară Iuliu Hațieganu; 2009.
4. Florescu S, Ciutan M, Popovici G, Ladea I, Petukova M. Studiul privind sănătatea mentală în România: aspecte principale ale prevalenței pe durata vieții și utilizării serviciilor în cazul tulburărilor mentale conform OMS. Management în sănătate; 2009.
5. Niculescu T, Todea A, Toma I. Medicina Muncii. București: Editura Medmun; 2003.
6. Codul muncii
7. Cioca L, Moraru R. Managementul riscurilor profesionale psihosociale. Sibiu: Editura „Lucian Blaga” University publishing house; 2010.